

WHAT IS CLAIMED IS:

1. An apparatus for modifying the surface of a semiconductor wafer, said apparatus comprising
 - 5 a) a fixed abrasive element comprising a plurality of abrasive particles;
 - b) a resilient element; and
 - c) a plurality of rigid segments disposed between said fixed abrasive element and said resilient element.
- 10 2. The apparatus of claim 1, wherein said fixed abrasive element comprises a textured, three-dimensional, fixed abrasive element.
- 15 3. The apparatus of claim 1, wherein said fixed abrasive element comprises a three-dimensional fixed abrasive composite.
4. The apparatus of claim 1, wherein said fixed abrasive element is bonded to said rigid segments.
- 20 5. The apparatus of claim 1, wherein said rigid segments are bonded to said resilient element.
6. The apparatus of claim 1, wherein said fixed abrasive element is capable of moving relative to said rigid segments.
- 25 7. The apparatus of claim 1, wherein said fixed abrasive element and said rigid segments are capable of moving relative to said resilient element.
8. The apparatus of claim 1, further comprising
 - 30 a. a first web comprising said fixed abrasive element;
 - b. a second web comprising said plurality of rigid segments; and
 - c. a third web comprising said resilient element.

9. The apparatus of claim 8, wherein said first web and said second web are movable relative to each other.

10. The apparatus of claim 8, wherein said second web and said third web are
5 movable relative to each other.

11. The apparatus of claim 8, wherein said first web and said third web are movable relative to each other.

10 12. The apparatus of claim 8, wherein said first web, said second web and said third web are movable relative to each other.

15 13. The apparatus of claim 1, further comprising a web comprising
a first region comprising a first plurality of rigid segments having a
first cross-sectional area; and
a second region comprising a second plurality of rigid segments
having a second cross-sectional area,
said first cross-sectional area being different from said second
cross-sectional area.

20 14. The apparatus of claim 1, wherein said rigid layer comprises a material selected from the group consisting of metal and plastic.

25 15. A method of modifying the surface of a semiconductor wafer, said method comprising:
a) contacting the abrasive article of claim 1 with a semiconductor wafer; and
b) moving said semiconductor wafer and said abrasive article relative to each other.

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16. The method of claim 15 further comprising:

a) contacting a first region of the abrasive article with a semiconductor wafer, said first region comprising a first plurality of rigid segments having a first cross-sectional area;

5 b) moving said semiconductor wafer and said fixed abrasive article relative to each other;

c) contacting a second region of the abrasive article with the semiconductor wafer, said second region comprising a second plurality of said rigid segments having a second cross-sectional dimension; and

10 d) moving said semiconductor wafer and said fixed abrasive article relative to each other.

17. The method of claim 16, wherein said abrasive article further comprises a web, said web comprising said plurality of rigid segments, said method further comprising indexing said web from a first position to a second position.